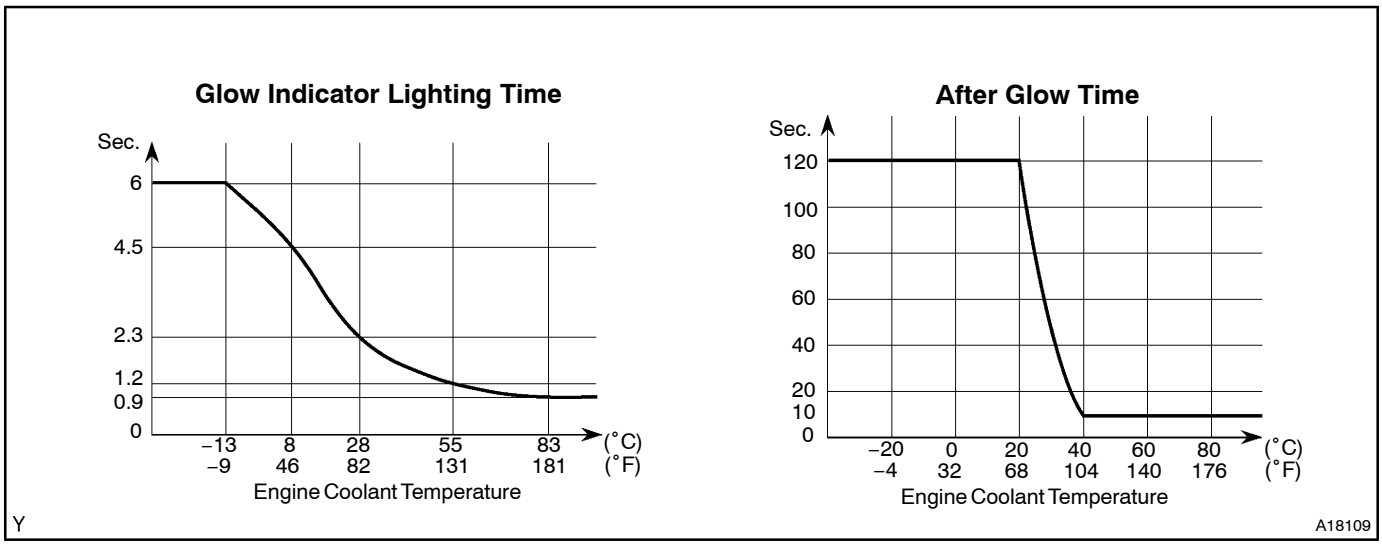
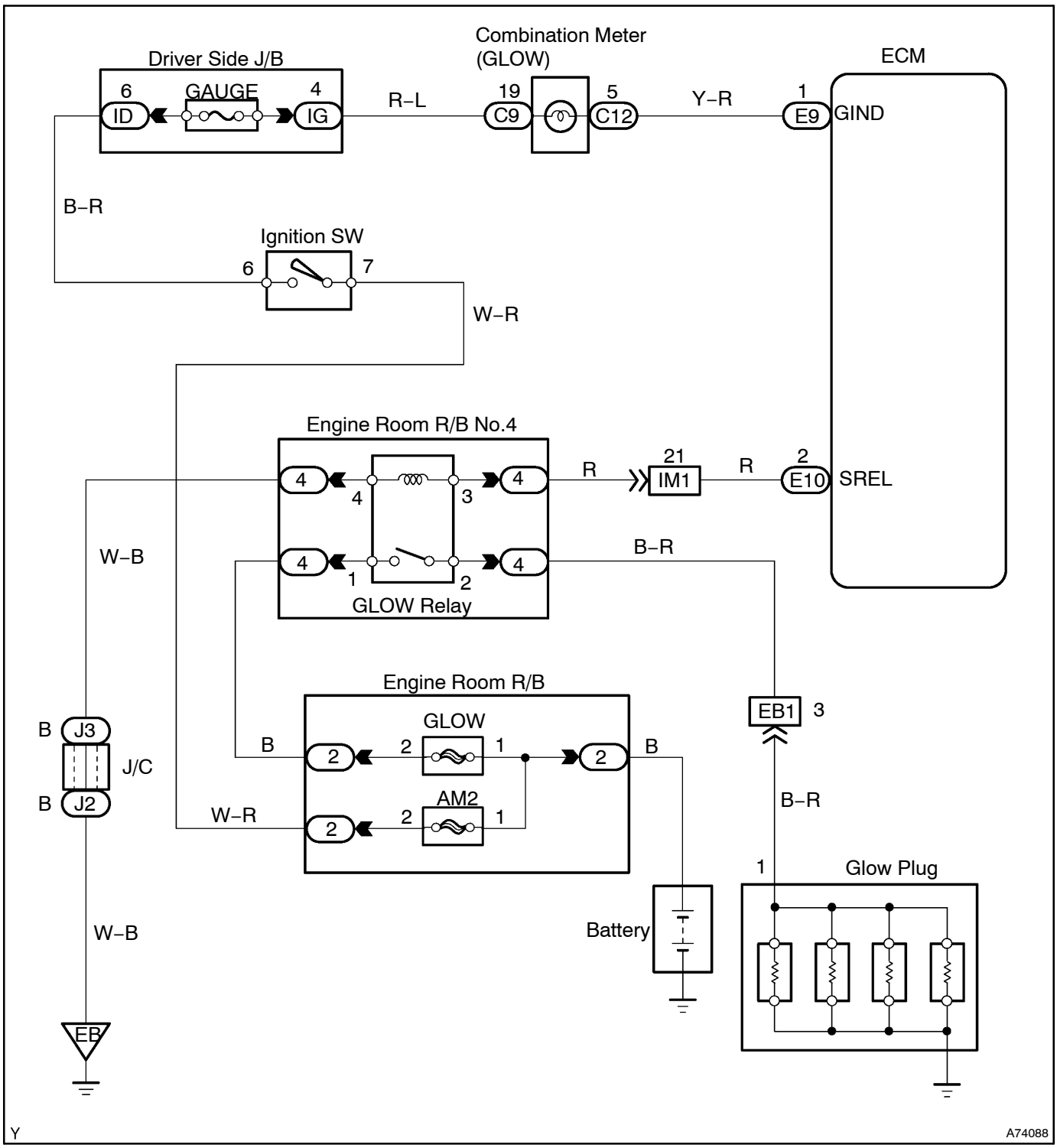
PRE–HEATING CONTROL CIRCUIT

CIRCUIT DESCRIPTION

When the ignition switch turns ON, the ECM calculates the glow indicator lighting time/heating corresponding to the coolant temperature at that time and turns ON the glow indicator light/glow plug relay.
As the ceramics is used for a glow plug material, the current control is not performed.



WIRING DIAGRAM



INSPECTION PROCEDURE

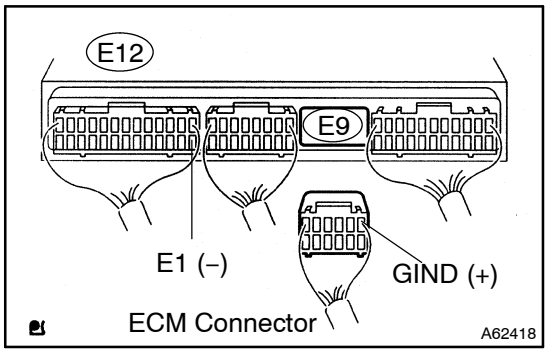
1 CHECK GLOW INDICATOR LIGHT

(a) Turn the ignition switch ON.
(b) Does the glow indicator light up?
(c) The glow indicator lights up for 0.5 sec. or more.

OK → **Go to step ****

NG

2 INSPECT ECM(CHECK VOLTAGE)



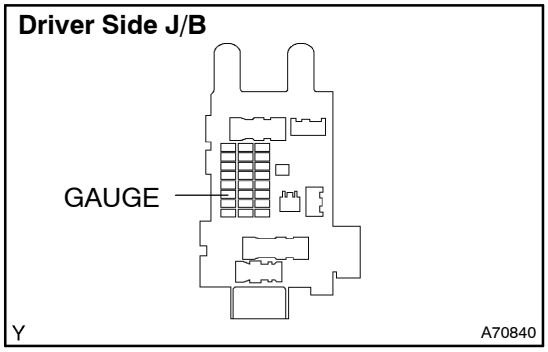
(a) Disconnect the ECM E9 connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between the terminals of the ECM connector.
Voltage:

Symbols (Terminal No.)	Specified condition
GIND (E9 – 1) ⇔ E1 (E12 – 14)	9 – 14 V

OK → **CHECK AND REPLACE ECM**

NG

3 CHECK FUSE(GAUGE FUSE)



(a) Remove the GAUGE fuse from the driver side J/B.
(b) Check the continuity of the GAUGE fuse.
Resistance: Continuity

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED GAUGE FUSE**

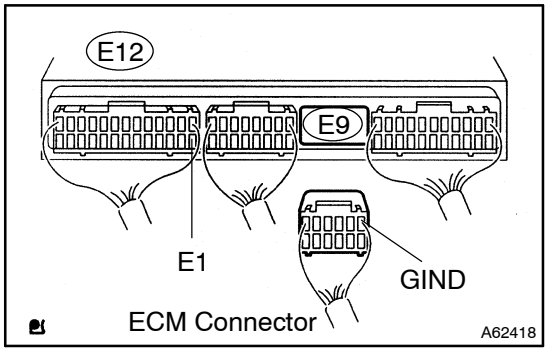
OK

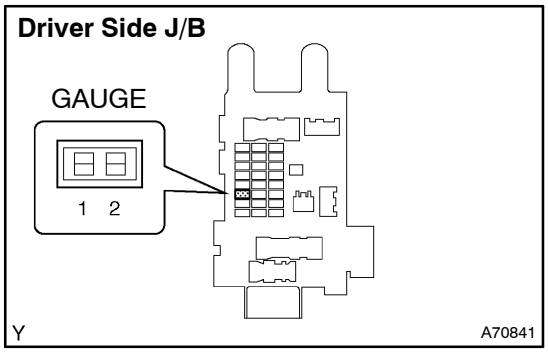
4 CHECK GLOW INDICATOR LIGHT

NG → **REPLACE BULB**

OK

5	CHECK HARNESS AND CONNECTOR(ECM – COMBINATION METER, COMBINATION METER – GAUGE FUSE)





(a) Disconnect the ECM E9 connector.
(b) Disconnect the combination meter C9 and C12 connector (See page 71–25).
(c) Remove the GAUGE fuse from the driver side J/B.
(d) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
GLW– (C12 – 5) (Terminal arrangement on 05–1554) ⇔ GIND (E9 – 1)	Continuity
L (GAUGE fuse terminal 2 of J/B) ⇔ IG+ (C9 – 19) (Terminal arrangement on 05–1554)	

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM

6	CHECK FOR INDICATOR LIGHTING TIME AND AFTER GLOW TIME (See page 19–18)

NG → **CHECK AND REPLACE ECM**

OK

7	READ OUTPUT DTC (See page 05–197)

SST 09843–18040

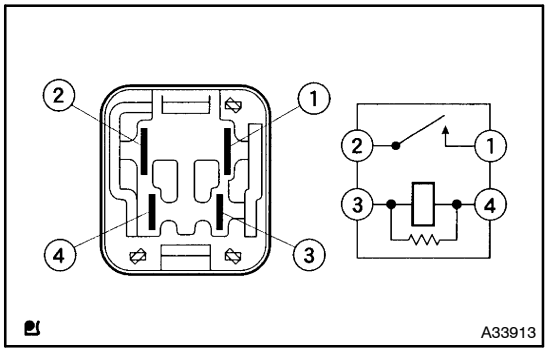
Result:

	A	B
RESULT	Other DTC is not output	Other DTC is output

B → **GO TO RELEVANT DTC CHART**

A

8 INSPECT GLOW PLUG (SUB) RELAY ASSY



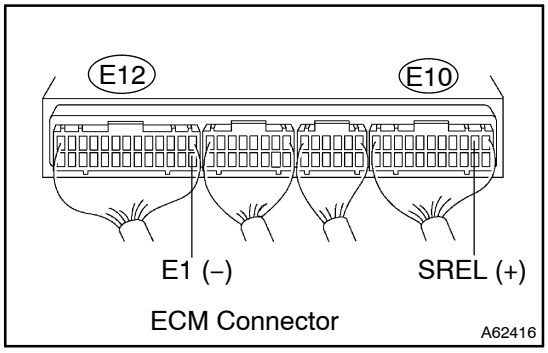
(a) Check the continuity between each terminals.
Standard:

Terminal No.	Condition	Specified condition
3 ⇔ 4	Constant	Continuity
1 ⇔ 2	Usually	No continuity
	Apply B+ between Terminals 3 and 4	Continuity

NG → **REPLACE GLOW PLUG (SUB) RELAY ASSY**

OK

9 INSPECT ECM(CHECK VOLTAGE)



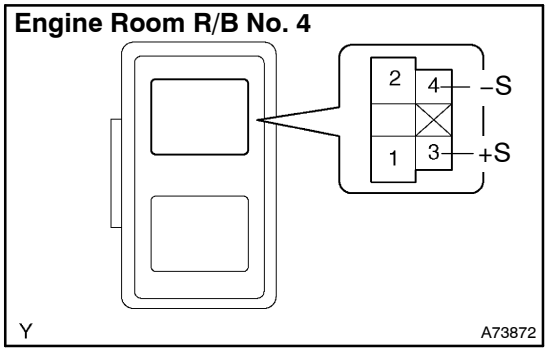
(a) Turn the ignition switch START.
(b) Measure the voltage between the terminals of the ECM connector.
Voltage:

Symbols (Terminal No.)	Condition	Specified condition
SREL (E10 – 2) ⇔ E1 (E12 – 14)	Cranking	9 – 14 V

NG → **CHECK AND REPLACE ECM**

OK

10	CHECK HARNESS AND CONNECTOR(ECM – GLOW PLUG RELAY, GLOW PLUG RELAY – BODY GROUND)



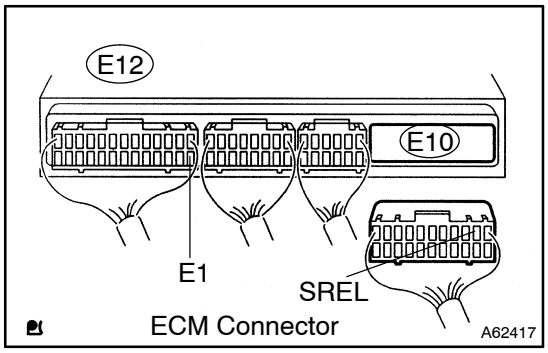
(a) Disconnect the ECM E10 connector.
(b) Disconnect the glow plug relay from the engine room R/B No. 4.
(c) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
+S (GLOW relay terminal 3 of R/B) ⇔ SREL (E10 – 2)	Continuity
–S (GLOW relay terminal 4 of R/B) ⇔ Body ground	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
SREL (E10 – 2) ⇔ E1 (E12 – 14)	No continuity



NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

11	INSPECT GLOW PLUG ASSY (See page 19–20)

NG → **REPLACE GLOW PLUG ASSY (See page 19–21)**

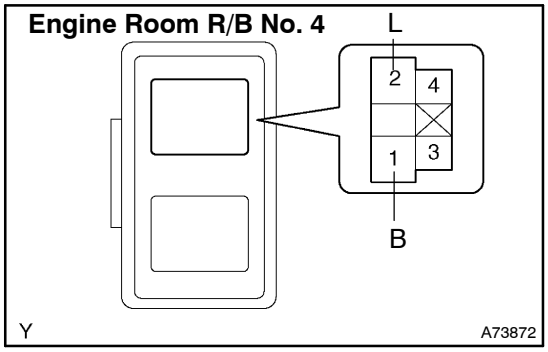
OK

12	INSPECT GLOW PLUG ASSY(INSTALLATION)

NG → **TIGHTEN GLOW PLUG**

OK

13	CHECK HARNESS AND CONNECTOR(GLOW PLUG RELAY – GLOW PLUG, GLOW PLUG RELAY – BATTERY)



(a) Remove the glow plug relay from the engine room R/B No. 4.
(b) Disconnect the glow plug wire.
(c) Check the continuity between the wire harness.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
L (Glow plug relay terminal 2 of R/B) ⇔ Glow plug wire	Continuity
B (Glow plug relay terminal of R/B) ⇔ Positive terminal of the battery	

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE
(See page 05–210)